

What is claimed is:

1. A protection device comprising:

a metal oxide varistor (MOV) element which increases in temperature when subjected to a voltage spike;

5 a thermal fusible layer upon at least a portion of a surface of said MOV element, said thermal fusible layer capable of conducting current and adapted to separate, at least partially, from the surface of the MOV element when the temperature of the MOV element reaches a predetermined temperature;

a first conductor having a first end and a second end, said first end coupled  
10 directly to a first surface of said MOV element and said second end adapted to be coupled to a source of current; and

a second conductor having a third end and a fourth end, said third end directly coupled to said thermal fusible layer and said fourth end adapted to be coupled to said source of current wherein said first conductor, said MOV, said thermal fusible layer and  
15 said second conductor operate as an MOV when said thermal fusible layer is held below said predetermined temperature and said thermal fusible layer and said MOV element establish a spark gap there between when said thermal fusible layer goes above said predetermined temperature due to heat provided by said MOV element.

20 2. The protection device of claim 1 wherein said MOV element has a first face and a parallel, spaced apart second face and said thermal fusible material layer covers less than all of said first face.

3. The protection device of claim 2 further comprising:

25 a layer of insulation upon said thermal fusible material; and

a connection tail extending from said thermal fusible material layer onto said layer of insulation and said second conductor third end is coupled to said thermal fusible material layer through said connection tail.

4. The protection device of claim 1 wherein said MOV element has a first face and a parallel, spaced apart second face and said thermal fusible material layer covers less than the full extent of said first face.

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5. The protection device of claim 4 further comprising:  
a layer of insulation on said thermal fusible material layer; and  
a connection tail extending from said thermal fusible material layer onto said layer of insulation and said second conductor third end is coupled to said thermal fusible material layer through said connection tail.

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6. The protection device of claim 5 wherein said thermal fusible material layer and said layer of insulation are generally concentric and circular.

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7. The protection device of claim 1 wherein said thermal fusible material layer is rectangular and covers less than the full extent of said surface of said MOV.

8. The protection device of claim 7 further comprising:

a rectangular layer of insulation upon said rectangular thermal fusible material layer; and

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a connection tail extending from said thermal fusible material layer onto said layer of insulation and said second conductor third end is coupled to said thermal fusible material layer through said connection tail.

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9. The protection device of claim 1 wherein said MOV element has a first face and a parallel, spaced apart second face and said thermal fusible material layer is of a cruciform shape mounted adjacent said first face.

10. A protection device for a metal oxide varistor (MOV) comprising:

a first semi-circular segment MOV element defined by a first straight side edge and a first curved side edge;

a second semi-circular segment MOV element defined by a second straight side edge and a second curved side edge; said first semi-circular segment and said second  
5 semi-circular segment generally describing a circular MOV element when said first straight side edge is held parallel with said second straight side edge;

said first semi-circular segment MOV element and said second semi-circular segment MOV element heat up when exposed to voltage spikes;

said first semi-circular segment having a first front surface and a first rear surface,  
10 said second semi-circular segment having a second front surface and a second rear surface;

a thermal fusible material layer extending between said first semi-circular segment first straight edge surface and said second semi-circular segment second straight edge surface, said thermal fusible material later capable of conducting current there  
15 through and having a predetermined temperature at which it melts,

a first conductor having a first end and a second end, said first end coupled to one of said first front or first rear surfaces of said first semi-circular segment and said second end coupled to a source of current; and

a second conductor having a third end and a fourth end, said third end coupled to  
20 one of said second front or second rear surfaces of said second semi-circular segments and said fourth end coupled to said source of current whereby current is permitted to flow through said first conductor, said first semi-circular segment, said thermal fusible material layer, said second semi-circular segment and said second conductor when said thermal fusible material layer is held below said predetermined temperature and said first  
25 straight edge surface of said first semi-circular segment and said second straight edge surface of said second semi-circular segment establish a spark gap there between when said thermal fusible layer goes above said predetermined temperature and melts due to the heat provided by said first and second MOV segments.

11. The protection device of claim 1 further comprising;

a layer of insulation surrounding said first front surface, said first curved side surface, said first rear surface, a rear surface of said thermal fusible material layer, said second rear surface, said second curved side surface, said second front surface and a front  
5 surface of said thermal fusible material layer.

12. The protection device of claim 12 wherein said layer of insulation has a top surface and a bottom surface.

10 13. The protection device of claim 13 further comprising:

an air gap extending from said layer of insulation top surface to said bottom surface along one side of said thermal fusible material layer.